

**MEMORANDUM OF AGREEMENT**  
**Between the**  
**Federal Aviation Administration (FAA)**  
**William J. Hughes Technical Center**  
**and the**  
**National Aeronautics and Space Administration (NASA)**  
**Ames Research Center**  
**Concerning**  
**Air Traffic Management Research and Technology Development**

**I. Purpose**

This Memorandum of Agreement (MOA) establishes a collaborative working relationship between the NASA Ames Research Center and the FAA William J. Hughes Technical Center (hereinafter referred to as "the Technical Center") supporting the NASA Aviation Systems Capacity Program and FAA Air Traffic Management (ATM) with respect to conducting research, development and technology transfer to FAA. This MOA is established as provided under the FAA/NASA Memorandum of Understanding (MOU) on Airspace System User Operational Flexibility and Productivity, dated September 11, 1995.

**II. Background and Rationale**

The Inter-Agency Integrated Product Team (IAIPT) established by the FAA/NASA MOU sets forth a process, agency responsibilities and plan for cooperation and collaboration in ATM Research and Development (R&D). Ames Research Center and the Technical Center have members on the IAIPT, and are two of the membership organizations responsible for developing and implementing the integrated plan. Ames Research Center has unique national capabilities and facilities for performing ATM research and technology development. The Technical Center has unique national capabilities and unique facilities for performing ATM research, development, and for the transition of technology into the FAA.

This MOA establishes the general approach in which the Technical Center and Ames Research Center will collaborate to use their capabilities and facilities in the most effective manner to conduct work that supports the Joint Research Project Descriptions (JRPDs) within the Integrated Plan for Research and Technology Development (hereinafter referred to as the "Integrated Plan"), which is under the auspices of the IAIPT. The general approach represents expanded roles for the Technical Center in ATM R&D. Implementation of these expanded roles will be evolutionary, starting with increased collaboration in research and progressively increased collaboration in technology validation and its transfer to operational systems. The Technical Center

responsibilities will grow as confidence to perform these roles is developed and accepted by the FAA Integrated Product Teams (IPTs).

### **III. Objective/Scope**

The objective of this MOA is to establish the working relationship and process by which resources can be authorized for the most effective use of Ames Research Center and the Technical Center capabilities and facilities to implement tasks within the Integrated Plan. A major emphasis of this MOA is to assure effective and expeditious transfer of technology to the FAA, that is, to improve efficiency and reduce the time needed to develop new concepts and technology into ATM products and services.

The scope of this MOA includes: agreements for temporary detail of personnel between Centers; use of major facilities at the Technical Center and Ames Research Center, including networked simulation facilities; funding approaches and authorization, including transferring of funds between centers; and working relationships with contractor teams.

This MOA does not limit the use of other resources by Ames Research Center or the Technical Center, or by other organizations required to implement the Integrated Plan's JRPDs, nor does it modify or limit any existing agency or center roles or responsibilities.

### **IV. Statement of Work**

#### **A. Working Relationships**

The Technical Center/Ames Research Center partnership is intended to achieve greater continuity and a more efficient transition of technologies from the concept R&D phase to product/system development and deployment into the NAS. The working relationship between Ames Research Center and the Technical Center, and the process used to fulfill the objective of this MOA, will depend on the type of R&D activities to be undertaken as defined in Sections A.1 and A.2.

#### **A.1. Collaboration in Exploring Candidate Technology**

In the early stage of research, prior to defining candidate technologies for product development, collaborations between Ames Research Center and the Technical Center will continue to be conducted in a manner most effective for each individual project by mutual agreement, rather than by the process outlined in Section A.2.

#### **A.2. Collaboration in Product Development and Technology Transfer**

The following working relationship will apply, in general, when a technology has been identified for development into a potential product for operational implementation.

Within the approved JRPDs of the Integrated Plan that require the use of complementary Ames Research Center and the Technical Center resources, designated Ames Research Center and Technical Center representatives will develop Implementation Plans (IPs) for the most effective use of the resources needed to conduct the tasks. In particular, the plans should address the process for effective and expeditious transfer of technology from NASA to the FAA.

In general, the IPs should provide for:

1. Early participation of the Technical Center personnel in the research at Ames Research Center to obtain an understanding of the technology;
2. Validation and/or assessment of the technology in high fidelity laboratories and/or simulations using the most effective combinations of the Technical Center and Ames Research Center facilities, including, if appropriate, networked facilities;
3. Joint participation in field trials (i.e., research, testing, and assessments conducted at FAA operational facilities), if appropriate;
4. Assumption of responsibility by the Technical Center for the transition and operational implementation of technology into FAA systems within the FAA IPT process, subject to approval of the responsible FAA IPTs.

The general Ames Research Center/Technical Center responsibilities are as follows:

1. Ames Research Center shall start as lead for research and the validation/assessment of new concepts and technologies when activities primarily utilize Ames Research Center facilities;
2. Recognizing that the Dallas-Ft. Worth (DFW) sites are important and integral facilities for Ames Research Center to continue concept exploration and development, Ames Research Center will retain the lead for research at those sites;
3. Ames Research Center shall provide technical expertise, as appropriate, during validation/assessment when using the Technical Center facilities and during field trials;
4. Ames Research Center shall provide technical expert consultation, as appropriate, during transition of new concepts and technology to operational implementation;
5. The Technical Center shall also conduct research, as identified in the Integrated Plan;
6. The Technical Center shall assume the lead when using their primarily facilities for validation/assessment of the new concepts and technologies, and when conducting field trials at other FAA sites;

7. The Technical Center shall provide operational and National Airspace System (NAS) expertise, as appropriate, to support the development of new concepts and technology.

This paradigm is intended to be the general approach. The approach may be altered if a different approach is determined jointly by the Technical Center and Ames Research Center authorized representatives to be more effective and/or expeditious for development and transition of the new concepts and technologies identified in the Integrated Plan JRPDs. Procedures to modify this MOA are addressed in Section VIII.

## **B. Funding and Liability**

The intent of this MOA is for Ames Research Center and the Technical Center to share resources, including funding, of any cooperative or joint programs consistent with the authority and approved operating plan of each agency. The allocation of those resources are to be specified and approved within the IPs, as defined in Section IV.C. Under such plans, Ames Research Center and the Technical Center are authorized to allocate resources, including personnel, facilities, and funding necessary to perform specified tasks. Resource commitments are subject to availability.

Upon obtaining the appropriate approvals, each agency has the authority to award contracts, grants, cooperative agreements, other transactions, and execute IPs, as well as licensing agreements and other forms of technology transfer, as necessary to accomplish a given task. Such awards are to be made strictly in accordance with applicable center/agency policies and procedures.

Each party agrees to assume liability for its own risks associated with agreements and activities undertaken in this MOA.

## **C. Implementation Plans**

Under this MOA, IPs shall be developed to conduct R&D activities in areas identified in the Integrated Plan JRPDs. These IPs shall be authorized on a case-by-case basis for each task, and when approved, will become part of the Integrated Plan.

The IPs shall detail the objectives, scope, elements of performance, resources, responsibilities, authorities, schedule, and products associated with work to be performed. Each IP shall be approved prior to performing any work or tasks identified under the plan. All plans and agreements entered under this MOA shall conform to the statutes, federal regulations, orders, and directives which are applicable, including any special legislation applicable to each agency.

Each IP shall include, at a minimum, the following detailed information:

## 1. Task Description

The task description identifies and describes an area or areas of research and development to be undertaken which supports one or more JRPDs in the Integrated Plan.

## 2. Technical Approach

A proposed technical approach for a stated task shall describe strategy, design, tools, and analysis techniques for conducting studies, simulations, operational assessments, human factors research, systems engineering and prototype development, as appropriate.

## 3. Resources and Cost Estimates

The IPs shall identify the proposed approach and all resources required to accomplish a task. Labor categories, estimated hours, loaded rates and cost estimates shall be provided. All needed equipment and/or software purchases, air traffic controllers, and/or contractor consultants shall be identified as direct cost items. If funds are to be transferred between parties, each source must be identified and the parties must ensure that funds are properly allocated.

## 4. Contractor Resources

Implementation of some tasks under an IP may require formation of contractor teams to assist in R&D, validation/assessment, field trials, and/or technology transfer. When the participation of Technical Center and/or Ames Research Center personnel on an integrated government/contractor team is the most effective approach to performing a task or subtask, the appropriate agreement will be established to provide for such teaming. These agreements may include Cooperative Research and Development Agreements (CRDAs), contracts, or other forms, depending on the requirements of a given task. These agreements shall be developed and approved prior to performing work under such agreements.

## 5. Task Management

Each IP shall define a task management approach, which will depend on the scope and required resources associated with the task.

## 6. Products/Deliverables

Products and deliverables produced under each IP may include, but not be limited to, plans, schedules, briefing materials, reports, hardware, software, training materials, and technology transfer materials.

## **7. Schedule**

Detailed schedules, including start and completion dates and duration's for key milestones, shall be included within the IPs.

## **8. Approvals, Authorizations, and Funding**

The level of approval and authorization to commit resources shall be determined on a case-by-case basis, depending on the requirements of the task. Approvals and authorizations shall be obtained from the Technical Center and/or Ames Research Center organizations (branch-level or higher) that control the resources, such as staffing, facilities, equipment, and/or funding, which are needed for the task. Managers who control those resources shall be identified and their commitments shall be documented in the IP. No funding agreements will be executed before funds are authorized and made available for the task.

## **V. Technical Representatives**

The following individuals are responsible for the oversight of this MOA at their respective centers; however, they do not have the authority to unilaterally alter any of the terms of this MOA:

1. Mr. Richard D. Page, (609-485-5285)  
FAA William J. Hughes Technical Center, ACT-200 IAIP Member
2. Dr. J. Victor Lebacqz, (650-604-5792)  
NASA Ames Research Center, Aviation System Capacity (ASC) Program Manager

Any disputes which may arise under this MOA will be resolved by the Technical Representatives in accordance and compliance with appropriate FAA and NASA policies and procedures.

## **VI. Dissemination of Information**

NASA and/or the FAA may disclose or publish results obtained from the performance of work pursuant to this MOA, independently or jointly. To the extent permitted by applicable Federal laws and regulations, the initial release of any information to the public concerning results or conclusions made in performance of tasks under this MOA shall require prior written approval of the Technical Center/Ames Research Center Technical Representatives identified in Section V.

In regard to special rights in technical data, software, and other intellectual property, if either party or parties require nonstandard rights in technical data, software, or other forms of intellectual property, these rights must be identified by the party requiring these

nonstandard rights and acquired by the party responsible for the arrangements under which such assets are acquired.

## **VII. Period of Performance**

This MOA shall become effective upon the signature of the last approving party identified in Section IX, and shall remain in effect for a period of five years unless terminated by mutual agreement under the process outlined in Section VIII.

## **VIII. Modifications/Amendments/Termination**

No verbal or written statement by any person other than NASA and FAA signatories, their successors, or their designees, acting within the scope of their authority, shall modify or otherwise affect the terms of this MOA. Any changes to the terms, conditions, or scope shall be in writing and executed in accordance with each agency's policies and procedures. Modifications, at a minimum, shall include an identifying number, title and the effective date, which shall be implemented within 90 days of jointly approving a modification.

Either party may terminate this MOA 180 days after written notification of intent to terminate. Termination requires that the Technical Representative of the initiating party write a modification (Purpose only) stating the subject MOA is to be terminated, its identifying number, title and effective date of the termination. Upon termination, each agency will refund any portion of those funds that have been advanced, but not expended, in connection with the work specified in the MOA.

## **IX. Authority**


The legal authority for NASA to enter into this agreement is found in sections 203 (c) (5) and (6) of the Space Act of 1958, 42 U.S.C. 2473 (c), as implemented by NASA Management Instruction 1050.1E; and the legal authority for the FAA is the Federal Aviation Reauthorization Act of 1996, Public Law 104-264 (enacted October 9, 1996), Section 226 (Contracts), (codified at 49 U.S.C. 106(l)). Also, to the extent funds may be transferred between FAA and NASA for services and/or goods provided on a reimbursable basis, the authority is the Economy Act, U.S.C. 1535.

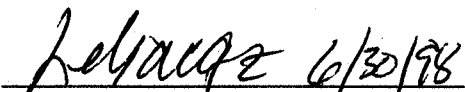
Further, this cooperative activity is established under the agreement for cooperation between the FAA and NASA concerning the FAA/NASA Coordinating Committee, signed by the agency administrators on January 30, 1990, and under the MOU on Airspace System User Operational Flexibility and Productivity between the FAA and NASA, dated September 11, 1995.

By our signatures below, we hereby indicate our agreement as outlined in this MOA between the National Aeronautics and Space Administration and the Federal Aviation Administration.

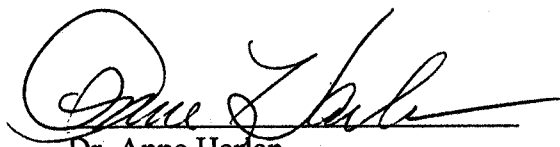
### APPROVALS


#### FAA/NASA Inter-Agency Integrated Product Team Co-leads

  
Robert S. Voss  
Leader, FAA Air Traffic Management  
Integrated Product Team

  
Dr. J. Victor Lebacqz  
Director, NASA Aviation  
Systems Capacity Program

#### Center Directors


  
Dr. Anne Harlan  
Director,  
FAA William J. Hughes Technical Center

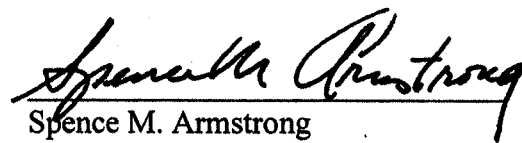
  
Dr. Henry McDonald  
Director,  
NASA Ames Research Center

Date: 6/12/98

Date: 7/2/98

### CONCURRENCE

  
Dennis DeGaetano  
FAA Acting Associate Administrator  
for Research and Acquisitions

  
Spence M. Armstrong  
NASA Associate Administrator  
for Aeronautics and Space  
Transportation Technology

Date: 7/8/98

Date: 17 Jul 98